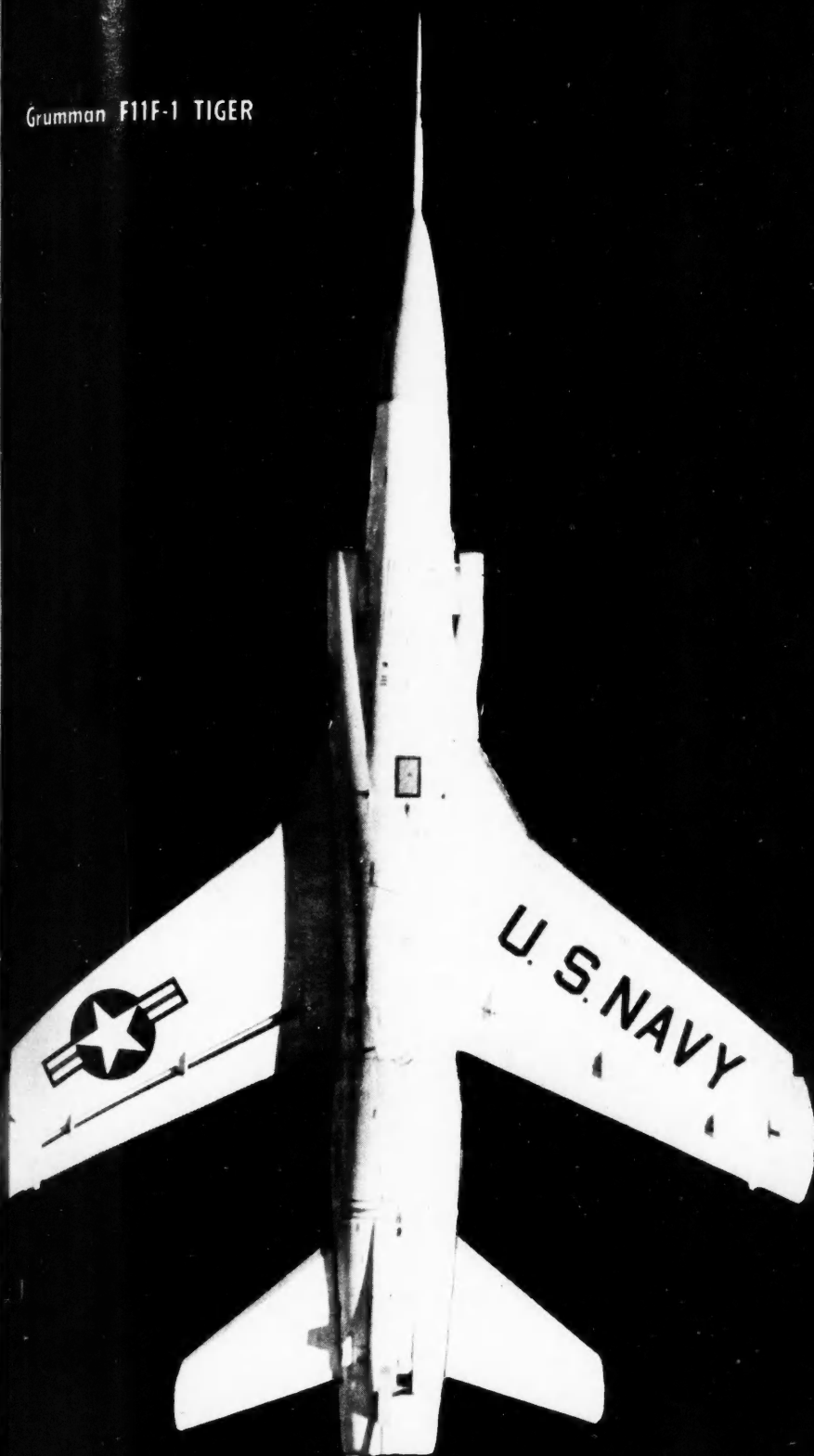


Grumman F11F-1 TIGER



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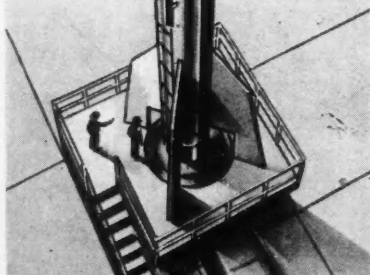
In this issue . . . **SPECIAL REPORT**  
on  
**The Navy Bureau of Aeronautics**

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#### OUR COVER

F11F-1 TIGER, one of the world's few combat airplanes capable of supersonic speeds in level flight, was designed to fill the Navy's need for a fast, hard-hitting aircraft with retaliatory ability to take the fight to any enemy's home ground. Now in service with Navy fleet units, Grumman TIGER carries most modern armament designed for fighters, including SIDEWINDER air-to-air missiles. TIGER is supersonic, reported unofficially to have flown faster than 1200 mph in level flight, and is powered by a Pratt & Whitney J-65 engine. TIGER aircraft are also used by the Navy's famed precision flying team, the Blue Angels. The TIGER is highly maneuverable and has good shipboard performance.

An advanced version, F11F-1F SUPER TIGER, powered by General Electric's J-79, is slated for later service.

## AUGUST 1958

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Published Monthly

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Volume 3

Number 8

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# data interviews

## The Chief of BuAer



Rear Admiral Robert E. Dixon, USN

Robert Ellington Dixon was born in Richland, Georgia, on April 22, 1906, son of R. J. and Willie (Brown) Dixon. After attending Richland High School and Marion Alabama Institute, he was appointed to the U. S. Naval Academy, Annapolis. Commissioned Ensign on June 2, 1927, he served aboard light cruiser USS RICHMOND before attending flight training in Pensacola. Designated a Naval Aviator on July 28, 1930, Dixon served on various ships, became C. O. of Scouting Squadron TWO when the U. S. entered World War II. Flying SBD-1s, he was awarded the Navy Cross and later a Gold Star in lieu of a second Navy Cross.

Captain Dixon was assigned to the Bureau of Aeronautics in April 1953, and on July 1, 1955, became a Rear Admiral. In August 1955 R/Adm. Dixon reported as Assistant Chief of the Bureau of Aeronautics for Research and Development. In February 1957 he was ordered to duty as Deputy and Assistant Chief of the Bureau of Aeronautics. On July 15, 1957, R/Adm. Dixon replaced R/Adm. James S. Russell as Chief BuAer.

**1. Admiral Dixon, as Chief, Bureau of Aeronautics, do you see more business or less for the small business contractor?**

**(a) Would the small contractor be better off if he devoted his efforts to subcontract work with the big primes and forget about direct Government contracts?**

I think I can best answer your question by speaking in terms of the prime contractor. Present trends indicate that there will be, in the near future, a significant increase in the percent of the procurement dollar which will go to the prime airframe contractor for two reasons.

First, the increased reliance by the Navy on the prime contractor for the development and production of components or equipments, as well as the airframe for aircraft now under development—commonly referred to as the Weapons System Concept—will bring a shift in funds from the Government furnished equipment to the airframe contractor when these aircraft are ordered in production quantity.

Second, there is increasing activity on the part of large airframe contractors in the development and production of missiles. This will bring increased dollars to many contractors although in some cases the increases will be counteracted by reduction in the procure-

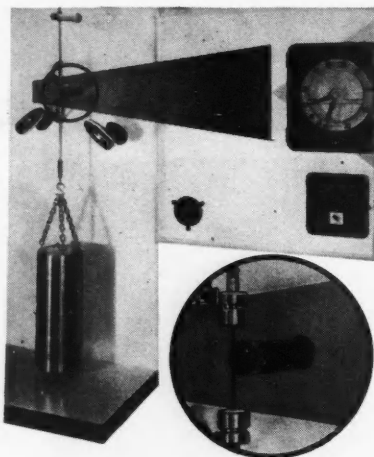
ments of manned aircraft.

Certainly, we have every intention of dealing with small business where advantageously possible. However, present trends would seem to indicate close attention on their part to the large primes.

**2. Admiral Dixon, do you feel the Navy is now getting their money's worth in what they are buying? Are they getting a dollar's value when they spend a dollar?**

Yes, or we would change our method of buying. However, it should be pointed out that modern aircraft are becoming increasingly complex, hence more expensive. The effect of the increased unit cost of airframes has necessarily been offset by a reduced number of aircraft purchased. Rises in the costs of Air Weapon Systems are probably sharper than most people realize. We have a money level that remains about the same from year to year; consequently, when costs go up, we simply are forced to buy fewer systems. The rate might surprise you: We will buy 30 per cent fewer aircraft this year than in the previous year.

The question as to whether we get dollar value for dollar spent applies to steak and shoes as well as to Air Weapon Systems; the cost of everything is high. Although we feel that when we buy a Weapon System we get



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# WHO'S WHO IN BUAER

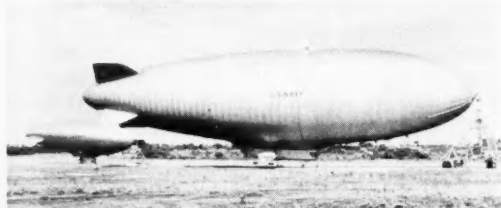
## ROSTER OF KEY PERSONNEL

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	Room No.	Extension
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<b>EXECUTIVE ASST.</b> Cdr. T. R. McClellan	2085	63180
<b>INSPECTOR GENERAL</b> Capt. J. A. Ruddy	2912	65572
<b>SMALL BUSINESS SPECIALIST</b> Cdr. D. S. Good	2105A (MunBldg)	66558
<b>NAVAL AIR RESERVE ASST.</b> Cdr. L. F. Steffenhagen, USNR	2942	62546
<b>COUNSEL</b> Mr. F. Sass, Jr.	3825	64304
<b>PATENT COUNSEL</b> Mr. F. J. Schmitt	2943A	65282
<b>AIDE</b> Lt. Cdr. S. O. Bach	2085	64216
<b>DEPUTY AND ASSISTANT CHIEF</b> Rear Admiral W. A. Schoech	2902	62022
<b>COMPTROLLER</b> Capt. J. K. Leydon	2926A	64241
<b>ASST. CHIEF FOR PLANS &amp; PROGRAMS</b> Rear Admiral D. J. Welsh	3074	64701
<b>SYSTEMS DIRECTOR</b> Capt. R. C. Millard	3078	63546
<b>PLANS DIRECTOR</b> Capt. S. M. Adams	3915	64987
<b>LOGISTIC PROGRAM DIRECTOR</b> Mr. M. L. Smith	3907	62394
<b>AIRCRAFT LOGISTICS DIVISION</b> Capt. R. M. Milner, Dir.	4E368 (Pent)	52259
<b>ASST. CHIEF FOR ADMINISTRATION</b> Capt. B. E. Day	2906	61611
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<b>ASST. CHIEF FOR PROCUREMENT</b> Rear Admiral W. T. Hines	2001 (MunBldg)	66225
<b>DIRECTOR, INDUST'L PLAN'G DIV.</b> Capt. C. W. Stirling	2004 (MunBldg)	64159
<b>DIRECTOR, PRODUCTION DIV.</b> Capt. S. W. Brown	2010 (MunBldg)	63805
<b>DIRECTOR, CONTRACTS DIV.</b> Capt. J. D. Arnold	2101 (MunBldg)	62905
<b>DIRECTOR, QUALITY CONTROL DIV.</b> Capt. R. F. Mahachek	2250 (MunBldg)	61816
<b>ASST. CHIEF FOR RES. &amp; DEVEL.</b> Rear Admiral L. D. Coates	2W65 (W Bldg)	62280
<b>ASST. CHIEF FOR FIELD ACTIVITIES</b> Capt. R. M. Reynolds	2202 (MunBldg)	65977



Above: Navy's fastest fighter: Chance Vought F8U-3 CRUSADER

Left: Navy's biggest blimp: Goodyear ZPG-3W

Right: Navy's newest trainer: North American T2J-1



reasonable results for money spent, perhaps an all out effort by both industry and Government toward reducing costs would pay off.

3. Admiral Dixon, what things has industry been doing that you do not approve of and would like to see corrected?

(a) What are your most pressing problems? Reliability? Standardization? Failure to meet delivery schedules?

In my opinion prime contractors are maintaining massive organizations built for World War II production and revitalized during the Korean conflict; these facilities are somewhat large for today's quantitative needs and also for the defense dollars available. Such overheads may have something to do with their price tags on manufactured equipment. *Such operating costs could be carefully examined by the contractors.*

Prime contractors could also make concentrated effort to secure a real competitive atmosphere among the sub-contractors. Attractive results might include reduced costs for sub items, wider participation geographically, and better standardization.

A practice, happily not widespread, but one that causes concern is the one of over optimistic bid proposals. Extravagant claims about the performance of a proposed system, or about the time it will be in development, help no one, and worse, can be damaging. It places an agency such as BuAer in a bad position when the project falls on its face, and certainly we think much less of the contractor when it happens. Such a practice is damaging to the U. S. as a whole, since military operations may have been built on the thesis that a certain system would be able to perform such and such a mission at a given time.

Another problem with which the contractor is involved is the old one of excessive lead times; the time it takes to get an Air Weapon System off the drawing boards and into the Fleet. For a complex Naval Aircraft System this time is anywhere from four to six years. The state of the art in Aeronautical Science is moving so rapidly now that the danger of a system becoming obsolescent

before it flies is no longer a joke. It can happen. We can't say, "Oh, well, back to the old drawing board," because too much is at stake. We have to be right in our decisions when we are given the green light to development, and we have to battle excessive lead times constantly. *The ideas and the cooperation of industry have always been earnestly solicited in tackling these problems.*

4. What changes, policy-wise, do you forecast? New directives? Instructions? Changes in progress payments?

Again I must speak in terms of general trends and what I know of them because specific policy, directives, and instructions come down to us from Department of Defense policy makers.

During the remainder of 1958 there will be no significant impact on the BuAer Aircraft Procurement Program due to the increased emphasis on missiles. But it is not expected that this will be true in future periods. One might say that *the outlook for producers of manned aircraft looks a little more austere than that for missile and equipment producers.*

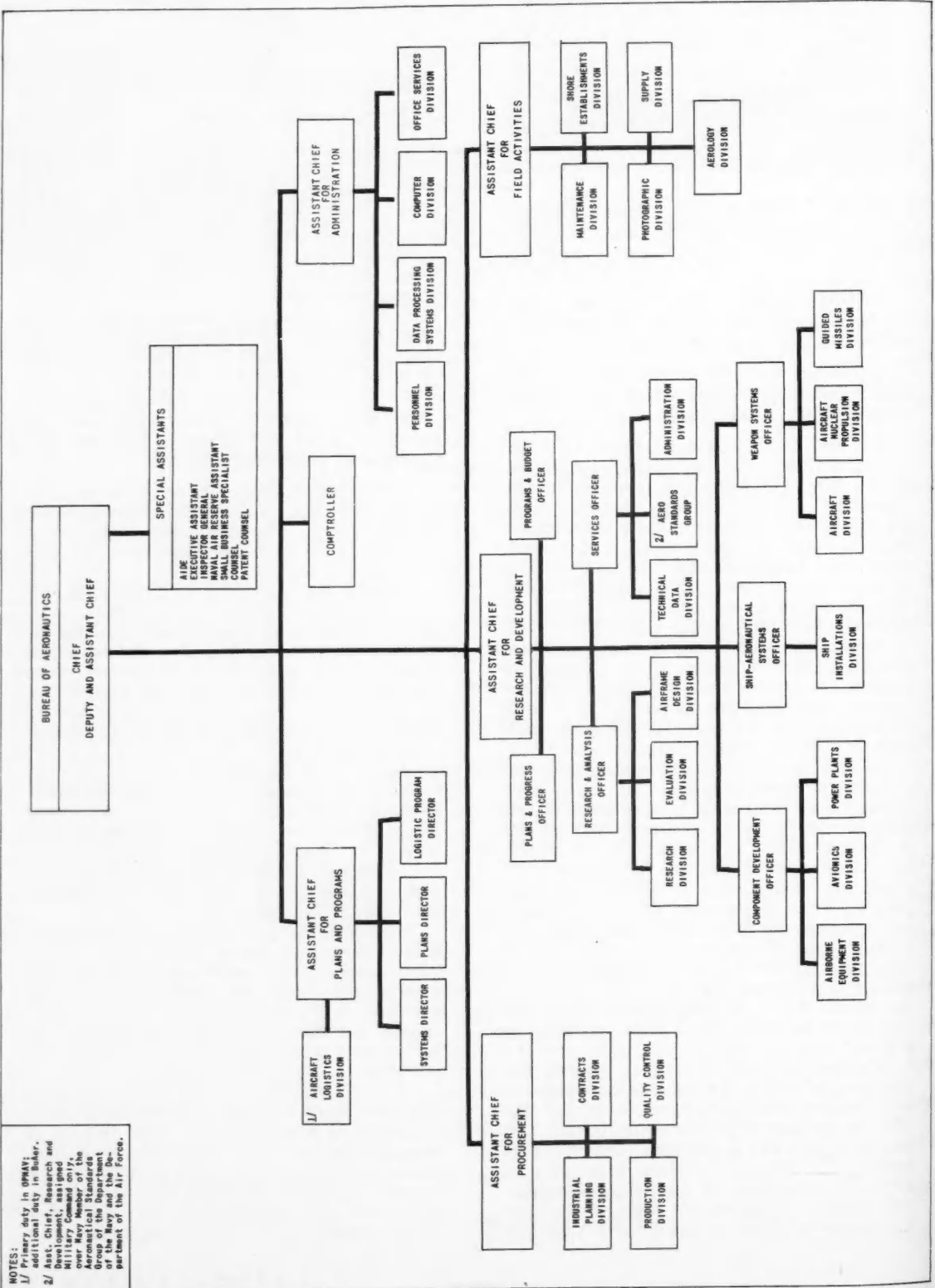
*In the field of aircraft engines, production levels should be reasonably stable through 1960 for the larger manufacturer. After this time, some decline may come about.* It does not appear that the reduced requirements for manned aircraft propulsion systems can be fully offset by demand for missile propulsion units.

*Although the percentage of procurement dollars that goes for direct avionics equipment procurement will remain about the same, five per cent, there will actually be an increase in avionics buying.* Indirect purchases through the prime contractor in his role as weapons systems managed will increase.

Aircraft contract terminations occurred last year, some of them sizeable, but no new terminations are planned at this time. It is possible, though, that adjustments to program quantities not yet on firm contract may become necessary. *Further, there can be no guarantee that terminations may not come about, especially if weapon systems costs*

# BUREAU OF AERONAUTICS

## ORGANIZATIONAL CHART





continue to soar.

In the matter of progress payments, reduction or increase of the maximum allowable payment, as we said, is the responsibility of DOD level policy makers. As far as I know, any changes would hinge upon the ability of the manufacturers to convince these policy makers that changes are necessary.

The picture can change, of course, in all these policy matters and trends if high level decisions are made to alter production or to change the emphasis. We cannot predict at this time what may happen along these lines.

5. You know, Admiral Dixon, some Congressmen, such as Carl Vinson, have been pushing for a restriction of negotiated bids, more advertised bids. How do you feel about that? Do you believe the negotiated bid is a good thing or a bad thing?

The subject of negotiated bids and advertised bids, which in some quarters has aligned itself in opposite schools of thought, is tremendously complex. It is complex because military procurement in itself is complex. To do the subject any sort of justice would require reams of documentation and opinion.

Without making an argument of it, I think it can be pointed out that each of the types of procurement has its time and place. The Bureau of Aeronautics practices advertised bidding whenever possible. We have to determine when and where this is possible by analysis of such things as the existence of a number of qualified and willing sources, whether the item can be publicized, where the specifications are not beyond the capability of a broad segment of industry, and where the design is sufficiently conventional to afford clear and adequate description. On the other hand, certain necessities stemming from the urgency of military need dictate that we must avail ourselves of special manufacturing talents, and do so with speed and selectivity. We then "negotiate," but always within the authority and criteria called out by law.

You can't say that one or the other type of procurement is "good" or "bad." Both are good but each has its place.

6. Did the success of the USSR in their Sputniks change Navy thinking? Appropriations? How?

There is nothing about the *Sputniks* that had not been thought about by the Navy. We were first interested in space flights about 1942. In 1946, first experiments took place utilizing high altitude plastic balloons.

Thinking for the human centrifuge program began in 1944. The human centrifuge is used to study the space environmental effects on human beings. The latest public-released Navy venture is participation in the X-15 program. As for satellites themselves, we have long been aware of the fact that these vehicles are naturals for navigational aids, communication relay, and weather reporting, as well as active reconnaissance. What the *Sputniks* have dramatically pointed out is that the state of the art in aeronautical science is advancing much more rapidly than we had calculated. And I might add that we thought our calculations were quite optimistic. The space age, so called, has come upon us quicker than we thought. There is Navy participation in these developments. The concrete effects, if any, of the *Sputniks*, space agencies, or space thinking upon immediate defense appropriations is yet to be seen.

7. In conclusion, Admiral Dixon, how does the future look for the Navy Bureau of Aeronautics contractors both large and small?

We can foresee no sweeping and dramatic changes that would alter the basic mission concepts which must be performed by Naval aviation. Anti-Submarine Warfare, Attack, Air Defense, Support, and Training assignments will continue to make up Naval Air's contribution to the nation's total sea power. This will take complex and specialized manned aircraft, guided missiles, and a myriad of related equipment in quantity. The role of the Navy in limited and all out nuclear war has been much discussed, and I think, need not be rehearsed here. Admiral Burke has stated the clear need for our attack carrier systems for at least fifteen years, longer, if conventional wars remain a threat. Now all this means that contractors, large and small, will participate. The future looks good. It would look even better for the contractors if some really effective means can be found to cut the rising costs of air equipment, and to reduce the lead times.





## BRIEFINGS

### MINUTEMAN CONTRACTOR SELECTION

AF's new solid propellant ICBM MINUTEMAN will use Avco as prime on nose cone, North American (Autonetics Div) for guidance, Thiokol does duty on first stage engines, Aerojet builds second stage power and backs up Thiokol on first stage with different engine case idea, Thiokol will also offer second stage ideas differing from Aerojet. Third stage prime is Aerojet with Hercules Powder exploring alternate approach. ///Dept of Defense press/

### DIRECTIVE ON SPARE PARTS DELIVERY

Be sure to request DOD Inst. 3232.7 if you supply spare parts. New reg lists revised requirements for contractors in spare parts supply. Write News Desk, Rm. 2E761, Pentagon, Wash, 25.

///Sec Def/

### FACT SHEET ON EXPLORER IV

Wt: 38.43 lbs. Shell wt: 7.50 lbs. Inst: 18.26 lbs. Length: 80 in. Dia: 6 in. High Power Trans: 30 milliwatts, 108.03 mega. Low Power Trans: 10 milliwatts, 108.00 mega. ///Army OPI/

### NAA X-10 NAVAHO TEST VEHICLES TO BE USED AS TARGETS

In new assignment X-10 research vehicle will test effectiveness of various interceptor missiles under simulated combat conditions. X-10 was originally developed as test vehicle for NAVAHO and has same aero config as NAV. ///North Am A/C/

### SEX IN OUTER SPACE

Convair Human Factor scientists advocate man-wife space teams for long lonely outer space explorations as way of minimizing problems of isolation. Drs. Conover and Kemp, in paper "Criteria for Selection and Training of Bio-Satellite Crews" given at Am Rocket Soc meet, recall that during WWII British had good experience with men and women being assigned to isolated anti-aircraft battery and observation duty stations. They performed their assigned tasks more efficiently and crews did not request replacement. Convair scientists think same would hold true for long space flight explorations, even suggest weightlessness might offer fascinating experiences. ///Convair Div Gen Dy/

### ARMY RESEARCH OFFICE MOVED TO ARLINGTON, VA.

Army Research Office moves from Ft. Belvoir to Arlington Hall Sta, Arlington, Va., to facilitate closer contact with Army Chief of R&D in Pentagon. ///Army Info 0710/

### MISSION OF NAVAL GUN FACTORY CHANGED

New mission will place primary emphasis on engineering services and prototype manufacture. ///Nav Gun Factory/

## INITIAL MOON SHOT FAILURE POINTS UP RELIABILITY NEED

Moon shot of 17 Aug was given one in ten chance of successful orbit. Instead, initial stage, THOR, blew up after 77 seconds. If man is to go in space, vehicle must be much more reliable. All services need equip with longer time to failure rate. *///DATA/*

## ARPA ANNOUNCES FORMATION OF ICBM DEFENSE GROUP

Under coord of Wm Hutchins, new ICBM Defense will be concerned with R&D of systems "beyond present state of the art." *///ARPA/*

## ARMY DEVELOPS AIR DROPPABLE TRACTORS FOR FUTURE NEEDS

Two versions — rubber tired and crawler. Lightweight machines are ballasted with dirt after parachute delivery. Sections detach, can be reassembled for different config, use with earth augers, cranes. Air drop tractors can do twice work load of similar size machines. Dirt for ballast loads in front, space can be used for other loads. *///Belvoir/*

## \$12.5 MILLION WILL GO TO NASA FOR SPACE PLANT

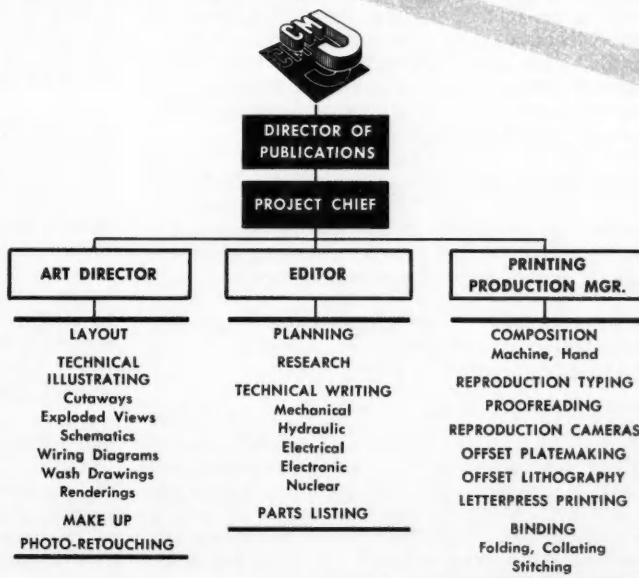
Wallops Island near Hampton, Va. will receive \$7,330,000 worth of electron track equip; \$2,520,000 for range op and control gear; \$1,850,000 for telemetry data receiving and record; \$800,000 to buy photo and optical gear. NASA will buy more land also. *///NASA/*

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expressed military needs

## **AERONAUTICS, MISSILES, AND SPACE TRAVEL**

### **AIRPLANES**

**767. CRASH RESISTANT FUEL TANKS.**—Ways to contain flammable fluid that will be resistant to breakage or rupture and subsequent spillage in case of survivable crash landings.

**766. SIMPLIFIED CONTROL SYSTEM.**—New ways to control aircraft to reduce pilot training time and to increase flight safety.

**765. HIGH LIFT DEVICES.**—New methods of increasing the aerodynamic lift for conventional wing or rotary wing aircraft, such as flaps and boundary layer control.

**692. WINDSHIELD RAIN DEFLECTOR FOR AIRCRAFT.**—A device to deflect rain so it will not impinge on the wind shields of aircraft, particularly when they are being operated in the landing pattern and during the landing operation. Such a device should not materially interfere with the pilot's vision.

**691. AIRPLANE MANEUVER RESTRICTOR.**—A device to prevent or make it very difficult for the pilot to overstress an airplane during maneuvers. Such a device should not be affected by airplane center of gravity position and should provide for early corrective action to prevent overshoot in a maneuver which has been started.

**683. METHODS FOR REMOVING ICE FROM AIRCRAFT PARKED IN THE OPEN.**—Mechanical, chemical or any other means and techniques for quickly, efficiently and cheaply removing snow and ice from parked aircraft and helicopters.

**682. ANTI-ICING AIRCRAFT.**—New chemical, mechanical or electrical ways and means of de-icing and anti-icing aircraft in flight.

**679. SIMPLIFICATION OF ROTOR SYSTEMS FOR ROTARY WING AIRCRAFT.**—Simplification of rotor controls in such a manner as to improve reliability, reduce cost, and weight. These are the controls which feather the blades cyclically and collectively. Simplification of the rotor hub to reduce the number of precision parts required, particularly for articulated blade systems. Particular attention should be paid to the means for providing blade retention with flapping, feathering and lead-lag motions. Objective is to reduce cost, weight and maintenance, while improving life of parts. Improvement in blade design and manufacture to lower manufacturing cost, to provide

complete reliability and to eliminate the restrictions of finite fatigue life.

**677. AIRPLANE CONTROL SYSTEMS.**—Means for reducing the friction in airplane control systems. Also improvements in the aerodynamic balancing of controls.

**675. AIRPLANE ARRESTING GEAR—FIVE PROBLEMS.**—a. Reduction in the magnitude of tensions in aircraft arresting wire rope system caused by high velocity impact on the static arresting wire. b. Devices for retarding an aircraft which has not been normally arrested, and which is accomplished in a short distance without personal hazard to the pilot. c. New devices for the absorption or conversion of kinetic energy of landing aircraft having characteristics superior to those currently in use or under development. d. Development of a device with which fleet squadrons can make a precise check of arresting hook recoil strut action to insure that the hook will perform satisfactorily while landing aboard a carrier. e. Development of a scheme that can be employed to disengage the arresting cable from the throat of the airplane arresting hook after the forward velocity of the landing aircraft has been checked by the arresting engines.

**670. FLEXIBLE HYDRAULIC CONNECTION.**—A lightweight, flexible connection (hose, swivel joint, etc.) for use in aircraft hydraulic systems, in lines which have relative angular and/or vibratory motion between ends of line, such as between a pump and firewall and actuating cylinder and structure. Must withstand operating temperatures between -90°F and +550°F or higher to 700°F. Must be leakproof, using sealing members suitable to temperature range. Military Application.—For use in high speed military aircraft hydraulic systems at operating pressures of 3500 psi.

**616. CRUISE CONTROL.**—A simple mechanical cruise control device or devices for use in turbojet powered aircraft. These devices must be capable of being carried in the aircraft and used by the pilot in flight, and shall present climb, level flight, climb-cruise, and descent information with all the applicable variables included.

**581. ROUGH TERRAIN LANDING GEAR.**—Landing gear to permit short landing and take-off aircraft to operate from unprepared areas, such as marshes, ploughed field and rocky surfaces. Must be lightweight.

430. **AUTOMATIC PITCH ADJUSTER.**—An automatic means of adjusting propeller pitch to maintain control thrust and thrust moment for propellers operating in non-cylindrically symmetric regions. This will reduce propeller vibration for pusher propellers placed behind wings or fuselage. Military Application.—Provide means for utilization of improved aerodynamic design.

#### HELICOPTERS, LIFTS

772. **AERIAL FUEL CARRYING EQUIPMENT.**—Means of converting cargo helicopters into aerial tankers. Equipment should be adaptable to air to air, air to ground and ground to air fueling and refueling.

771. **HELICOPTER RANGE EXTENSION.**—Fuel and refueling systems for extending the ferry range of helicopters. Systems should be simple, inexpensive and applicable to all helicopters currently in service.

769. **RETRACTABLE ROTOR SYSTEMS.**—A retractable rotor which will enable an airplane to take off vertically like a helicopter, then retract for forward flight.

764. **HIGH SPEED ROTOR SYSTEMS.**—Ways and means to increase the rotor tip speeds on rotary wing aircraft to permit higher aircraft velocities.

759. **EMERGENCY POWER SYSTEM.**—Instantly available power and/or stabilization system to maintain minimum flight control and to effect a safe landing of single engine, ducted fan aircraft vehicles.

755. **FLYING PLATFORM STABILIZER.**—A simple means of maintaining control about the vertical, horizontal and longitudinal axes of ducted fan flying platforms or vehicles.

696. **HELICOPTER INSTRUMENT FLIGHT.**—Satisfactory instrumentation, development of techniques and aids to permit instrument flight of helicopter under weather condition minimums equivalent to fixed-wing, transport type aircraft. Systems should have same degree (or improved) of reliability, simplicity, ease of maintenance, and should feature low cost, minimum effect on aircraft control, and performance characteristics.

684. **HELICOPTER TRANSMISSION SYSTEMS.**—New and improved helicopter transmission systems embodying advantages of simple design, small number of working parts, lightness and economy of initial cost and maintenance.

680. **MEANS FOR REDUCING ROTOR HUB PARASITE DRAG.**—The rotor hub contributes a considerable portion of the parasite drag of a rotorcraft. This becomes more serious as the ma-

chines are made aerodynamically cleaner (such as through retraction of the landing gear). A means for reducing the drag of hubs is needed. Present efforts to streamline or fair hubs have been only slightly successful. A system analogous to the radial engine cowling in drag reducing capability is sought.

681. **IMPROVED STABILIZING SYSTEM FOR ROTARY WING AIRCRAFT.**—Although there are several more or less successful stabilizing systems in existence, an improved system providing inherent static and dynamic stability for rotorcraft is needed. This system should have the characteristics of simplicity, low cost, low weight, complete reliability and easy maintenance.

676. **HELICOPTER LANDING GEAR.**—Improved lightweight amphibious landing gear for helicopters.

584. **HELICOPTER CONTROLS.**—A method of simplifying and improving existing control systems for helicopters under all regimes of flight. The system should be fail-safe and provide maximum error margin for the average pilot.

583. **REDUCING HELICOPTER VIBRATION.**—A method for reducing helicopter vibration to values considered acceptable for passenger comfort (as well as structural integrity) under all flight conditions.

582. **DECREASING HELICOPTER NOISE.**—A method for reducing the internal and external noise level generated by helicopter engines, power transmission systems, rotor systems, and other integral sources.

580. **INCREASING HELICOPTER STABILITY.**—Means for increasing helicopter stability.

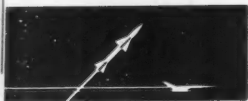
#### JETS, ROCKETS, SPACE TRAVEL

867. **AERIAL PLATFORMS.**—Ideas on aerial platforms, both manned and unmanned, for observation and missile launching.

749. **TURBOJET ENGINE NOISE SUPPRESSION DEVICES.**—A noise suppression device that can be applied internally or externally to a jet engine in order to effect an overall noise reduction of the order of five to 10 decibels. It is necessary that this noise reduction be at no appreciable loss in engine thrust and also that the suppression devices be airborne.

725. **PROJECTILE DECELERATION.**—A device to slow down the rate of descent of small projectiles such as a 155 mm shell to reduce the landing impact to an order of a few hundred G's. The device should be as compact as possible, not exceeding the shell size.





## AIR SPACE

### NUCLEAR SEAPLANE

studies being conducted by Martin for Navy got shot in arm with new \$385,000 contract announced 21 July. Studies will provide basis for development of fleet operational nuclear seaplane with unlimited range, earmarked for service in period 1964-65. In addition to Martin airframe, Navy also considering British Saunders-Rowe flying boat. ///Navy OPI 0721/

### ONE MILLION POUND THRUST VEHICLE

acknowledged to be designed for manned interplanetary exploration, now in AF contract. Rocketdyne, division of North American Aviation, has firm AF contract for powerplant. Parent, NAA, will probably get bid for airframe more than twice size of Convair's ATLAS. ///ARPA OPI 0730/

### NEW AIRSHIP NAVY'S LARGEST

built by Goodyear. Designated ZPG-3W, big bag has capacity of appx. 1,500,000 cubic feet. Envelope serves as natural "radome" for gigantic internally-mounted radar antenna. New Navy blimp has 21-man crew. Test flown 21 July. ///Navy OPI 0731/

### SPACE VEHICLE PHOTO RECON CONTRACT

went to Cornell Aero Lab on 22 July. Totaling \$200,000 contract will pay for study of new concepts for reconnaissance from space for gathering information of earth, moon and nearby planets. ///Cornell 0722/

### TILT-WING A/C FOR ARMY COMPLETES TEST

Vertol's Model 76 VTO has successfully completed first transition flight. ///Army OPI 0722/

### TWO CONTRACTS FOR HOUSING HUMANS IN CAPSULES

have been directed by ARPA. New contracts total \$400,000, will study ecological aspects of housing humans in capsules for long periods in outer space. ARDC will let contracts. ///ARPA OPI 574/

### ARMY AUTHORIZED TO PROCURE 35 MOHAWK AIRCRAFT

Grumman received \$22,200,000 for initial nine prototypes, now will get undisclosed figure for 35 more light-twin turbo-prop recon aircraft. Lycoming makes 1005 eshp powerplants.///Army OPI 0731/

### MILITARY AIRCRAFT MAINTENANCE

costs Dept. of Defense \$20 million a day. USAF in FY 1959 will spend \$1.3 billion on modernization and maintenance. Army will spend \$290 million. Navy will spend \$246 million. Appropriations will go mostly to private industry. ///AIA Info 0721/



# R4Y

## NAVY

# NAPIER

# ELAND

## CONVERSION

D. Napier & Son, Ltd., designers and manufacturers of the Napier Eland turbo-prop powerplant, have been manufacturers of precision engines for *more than 150 years*. The Napier automotive powerplant, used in the Napier-Railton racing car of John Cobb, holds the world's speed record. Napier industrial engines are used in every capacity from marine power to electric utilities.

The Napier turbo-prop aircraft powerplants converts existing piston power aircraft to jet turbine propulsion. It is the only turbo-prop with a *full-range variable speed engine* for complete accommodation in fuel economy. This resultant efficiency over a wide range of engine speeds assures adequate fuel reserve for holding patterns and means fuel money savings to the aircraft operator. This feature of the Napier Eland is an exclusive one, *not available in any other turbo-prop*.

Conversion of Navy R4Y Convair air transports to Napier Eland power increases useful load of the aircraft and extends range significantly at markedly increased speeds. With a take off weight of 53,200 pounds, capable with Napier Eland engines, range of the R4Y with its maximum payload is increased from 240 to 970 miles. With conversion to Napier Eland powerplants, the time spent climbing to cruising altitudes is cut by 54 percent. Speed at recommended cruising power is increased up to 48 knots.

Installation of the Napier Eland is easy. There's no beefing of the Convair airframe required. CAA will give Napier power Convairs approval without aerodynamic structural modifications. Only changes to the aircraft are 22 inch longer engine nacelles, cockpit control changes and brakes.

Navy air transport administrators, in common with commercial carrier operators, use four principal factors to determine value of their aircraft: (1) Range, (2) Payload, (3) Speed, (4) Operating Costs. All four are vastly improved with Napier Eland turbo-prop power.

## Napier Engines, Inc.

Dupont Circle Building, Washington 6, D. C.



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ENGINEERED BY PRODUCTION MATERIALS  
TO SOLVE PRODUCTION PROBLEMS

It's the carbide that cuts . . . and solving cutting problems becomes a simple matter of engineering the V-R carbide for the job. V-R Production Engineers have worked with thousands of cutting problems and developed carbides for maximum cutting efficiency in practically any application.

Put this fund of cutting know-how to work solving your problems. Just give us the details on the operations performed, material specs, speeds and feeds desired, dimensional tolerances, desired surface finish and all other pertinent data — it's dollars to doughnuts we've already engineered the V-R carbide for the job. V-R Engineers will work with you to fit the right carbide to the job and reduce cutting costs.

## For Ultra High-Speed Machining NEW CERAMIC VR-97

Ceramic VR-97 is an entirely new aluminum oxide cutting material made by an entirely new process. It's stronger and will outwear any previous ceramic grades because of its high purity and exceptional uniformity. Speeds of 1000 to 2000 surface feet per minute or higher are recommended because Ceramic VR-97 performs best on continuous cuts at ultra high speeds.

## For Cutting Speeds Between HSS and Carbides V-R TANTUNG<sup>®</sup> CAST ALLOY

V-R TANTUNG bridges the gap between maximum cutting speeds of high speed steel and practical minimum speeds of cemented carbides . . . and it's easy to grind with aluminum oxide wheels. High red-hardness; high transverse rupture strength; low coefficient of friction and high shock resistance are a few of the characteristics which make TANTUNG cast alloy the ideal tool material for intermediate cutting speeds.

Facts about TANTUNG . . . how to grind and braze . . . examples of production cost-savings, etc. Ask for Booklet No. 573.

- Solid Tool Bits
- Cut-Off Blades
- Tipped Tools
- Cast-To-Form Shapes

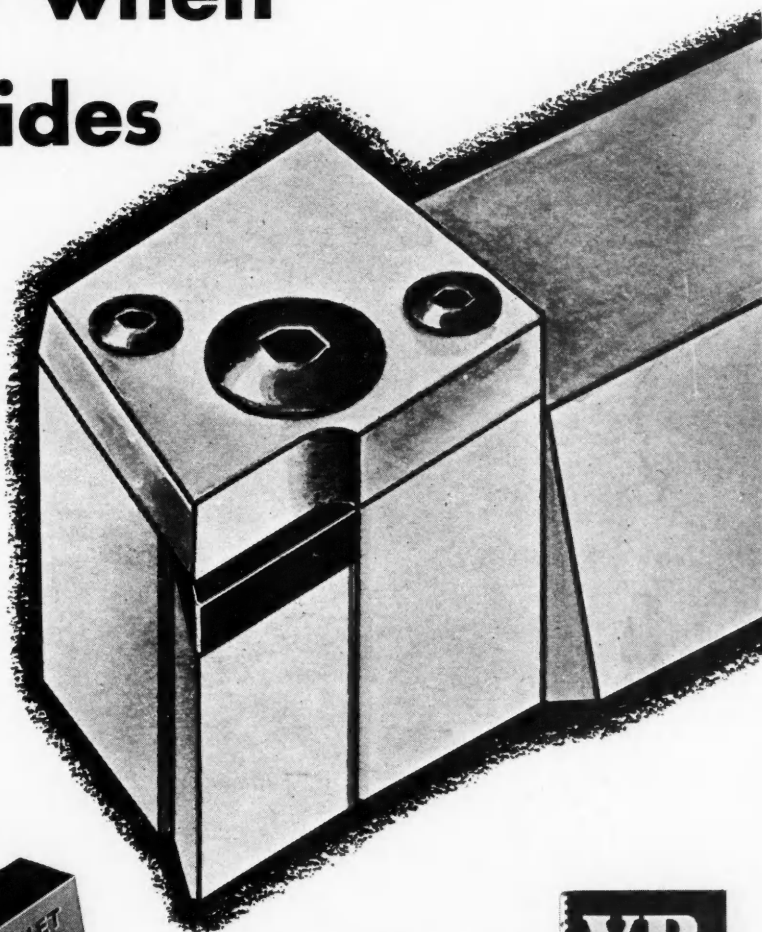


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WAUKEGAN, ILLINOIS

#### ELECTRONIC EARPHONE FOR ARMY SHUTS OUT LOUD NOISES

Major breakthru in noise reduction, new earphones developed by SigCor Ft. Monmouth will find wide use in tanks, planes where noise is top problem. Scientists created artificial quiet by adding more noise with miniature microphone in special earpiece, just as loud but opposite in phase. Sound suppressing earphones expected to have many commercial uses. RCA will produce. ///SigCor 0724/

#### NEW NIGHT VISION DEVICE USES LIGHT FROM STARS

Development makes possible seeing objects at tremendously increased ranges. Termed "Cascaded Photosensitive Image Intensifier," device gathers reflected starlight or skyglow from objective, then intensifies, presents image. Developed by Army R&D Ft. Belvoir with RCA. Heart of system is cascaded image tube using 25,000 volts from six-volt battery. ///Ft. Belvoir 0730/

#### HUMAN-LIKE ELECTRONIC PERCEPTION DEVICE

announced by Navy, electronic equipment capable of perceiving, recognizing and identifying without human training or control. Called "PERCEPTRON", device can read, remember and teach itself. Built along lines of human brain, PERCEPTRON appears to be first electronic concept with inherent capability of spontaneous organization. With direction of Dr. Frank Rosenblatt at Cornell, PERCEPTRON is under ONR contract. ///ONR 0707/

#### ARPA AUTHORIZES ARMY TO BUILD SPACE RADIO ANTENNA

Big 85-foot antenna will be built by Army's Jet Propulsion Lab, Pasadena. Prime contractors: Blaw-Knox, Collins Radio, Rucker. ///ARPA 0701/

#### POWERFUL RADIO FOR MARINE CORPS

will be built by Raytheon. New AN/TRC-27 contract totals \$15 million, sets operate in super high frequency range. ///USMC Info. 576/

#### NAVY AWARDS \$22 MILLION TO WESTINGHOUSE

for production of new shipboard radio and radar equip. One contract, over \$8 million, calls for production of advanced air-search radar for use on cruisers, carriers, other surface ships. Another contract, \$1 million, for existing radar. Over \$12 million contract for medium and high freq transmitters for surface and sub service. ///Navy OPI 0731/

#### WEAPON DIRECTION CONTRACT TO W-E FOR \$3.7 MILLION

Western Electric will make TERRIER guidance for new ships. Navy BuOrd contract. ///Navy OPI 0724/

#### HARBOR EXCAVATION BY ATOMIC BLAST

being investigated by AEC. As part of Project PLOWSHARE, AEC will study feasibility of excavating harbor in northwest Alaska, between Cape Seppings and Cape Thompson, north of Arctic Circle. If found safe and practicable, excavation takes place in 1960.

///AEC A-136/

#### CONTRACTS FOR ARMY RESERVE CONSTRUCTION TOTAL \$22 MIL

A total of 110 contracts for Army Reserve construction amounting to appx \$22,000,000, awarded during FY 1958, Army Info reports. Awards provide for 80 Army Reserve Centers, including 79 new constructions and purchase of one existing building.

///Army Info/

#### NEW CIVIL WORKS AUTHORIZATIONS LISTED BY ARMY ENGINEERS

Nbr. of Projects:	Type Project:	Cost:
68	Flood Control	\$ 545,579,800
12	Basin Authorizations	608,300,000
57	Rivers and Harbors	190,723,000
14	Beach Erosion Control	11,627,700
<u>151</u>		<u>\$1,356,230,500</u>
1	Dept. of Interior	200,000,000
<u>152</u>		<u>\$1,556,230,500</u>

State-by-state breakdown of these new authorizations, with cost of each project, available on request from Army Branch, News Division, Room 2E757, Pentagon, Washington 25, D.C.

///Army Info/

#### NAVY BUILDING \$60 MILLION OBSERVATORY IN W. VA.

Scheduled to begin after mid-August, Naval Radio Research Observatory will occupy 1500-acres at Sugar Grove, W. Va. Giant radio telescope for outer space observations electronic emission studies will be focal point of new observatory.

///Navy OPI/

#### AEC ISSUES CONSTRUCTION PERMIT FOR NACA REACTOR

New research and testing nuclear reactor for National Advisory Committee for Aeronautics will be built at Sandusky, Ohio, will cost estimated \$10,735,000. AEC has allocated 224 kilograms of U-235 to fuel NACA reactor through 1970.

///AEC 0721/

#### ATOMICS INTERNATIONAL BUILDING \$2 MILLION FACILITY

for remote handling at its nuclear field lab near L.A. Radioactive materials will be studied.

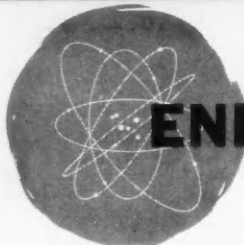
///North American Av 0721/

#### PROFITABLE SMALL PLANT LAYOUT

new booklet, number 21 in Small Business Administration Management series, write Govt. Printing Office, Wash. 25. 25 cents.

///SBA/





# ENERGY

## ENERGY IN ATMOSPHERE TAPPED AS POWER

by AF scientists at Rensselaer Polytechnic Inst. Oxygen molecules that absorb sun energy split into free atoms. New HARE (High Altitude Recombination Energy) missile, recombines atoms, heat released expands air, pushes back making thrust. ///ARDC 0808/

## ATOMICS INTERNATIONAL GETS \$76,000

for feasibility study on use of sodium reactor coolant as high-level radiation source for industrial processing. ///NAA AI-25/

## REACTOR SAFETY "FUSE" TESTED SUCCESSFULLY

A reactor safety "fuse", which automatically shuts down high power nuclear research reactors if operating control is lost, designed, built and successfully tested for AEC by Atomics International division of North American Aviation. ///AEC A-169/

## ARPA STUDIES CONTROLLED NUCLEAR EXPLOSIONS

Advanced Research Projects Agency announced that ARDC will let feasibility study to General Atomic for development of new concept of propulsion employing controlled nuclear reactions. //ARPA 0702/

## AEC COMPLETES ASSEMBLY OF ROCKET REACTOR

Project ROVER, study at Los Alamos to determine feasibility of nuclear power for rocket propulsion, moved another step forward with assembly of KIWI-A, experimental reactor which will be used to test ability as atomic propulsion unit. Presently without nuclear components, reactor will be reassembled with nuclear equipment at Jackass Flats after preliminary tests. ///AEC A-156/

## AEC LIFTS RESTRICTIONS ON URANIUM USES

Removal of restrictions on uranium uses will allow U.S. industry to resume industrial applications prohibited since WWII, such as in ceramics and glass products, primarily as coloring agents, in photo film, negatives and prints. Either normal uranium, purchased from private industry, or depleted uranium now available from AEC may be used. ///AEC A-158/

## SIGNIFICANT PROGRESS IN SUN-POWERED GENERATOR

reported by Air Research and Development Command. Once perfected, this method of converting solar energy to power would eliminate need of carrying fuel on space-bound vehicle. Harshaw Chemical Co. of Cleveland and Eagle-Pitcher Co., Okla., working with ARDC's Wright Air Development Center, have developed two cells, which, in relay, produce 150 milliwatts with 17 volts — or twice wattage used by latest EXPLORER satellite. ///ARDC 0714/

# LOGISTICS MATERIALS

## STANDARDIZED REQUIREMENTS ON SPARE PARTS DATA

Dept. of Defense Inst. 3232.7 lists standardized format and uniform requirements which contractors must submit to military agencies re: spare parts procurement. Request from SecDef News Desk, Rm. 2E761, Pentagon, Washington 25, D. C. ///SecDef/

## BREAD MIX BY ARMY FEEDS TROOPS IN FIELD RAPIDLY

Instant bread mix developed by Army Quartermaster is expected to revolutionize present methods of supplying armies with fresh bread. By substituting chemical leavening agents and dry flavoring materials for conventional fermentation process, time required to produce baked bread is about 70 percent. ///Army 0709/

## AEC SIGNS \$1.6 MILLION CONTRACT FOR GAMMA RAY FOOD IRRAD

Curtiss-Wright Corp will develop, design, construct and test major gamma irradiation facility at Lathrop, Calif. ///AEC 0723/

## NEW PLASTIC FOR MISSILE USE

has been announced by Reichold Chemicals. Laminated parts made of new PLYOPHEN will withstand 4500 degree (F) heats for brief periods, up to 500 degrees (F) for 100 hours. ///RCI 0709/

## ARMY EARTH-MOVING VEHICLE CALLED "EUCNIK"

used to battle Missouri river and close gap at Pierre, S. D. will haul 120 tons of earth and rock in single load at 35 mph. Giant machine stands 14 feet high, hopper body is 46 feet long, 15-1/2 feet wide. Contractor for the vehicle was Western Const. Corp. ///Army Info/

## LIGHTWEIGHT ENGINE CONTRACT TO GM, ALLISON DIV.

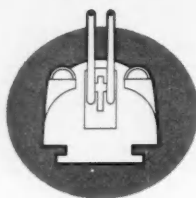
for development of 250-hp turbine a/c engine. Valued at \$3,200,000. Will be manufactured in two models — prop-jet for light planes and turbo-shaft for helicopters. New engine less than 39 inches long, weighs only 106 pounds in prop-jet version, only 35 inches and 90 pounds in helicopter powerplant version. ///Army OPI/

## A/C VIZ INCREASED WITH GLO PAINT

Bright luminous orange paint provides new look to more than 13,000 non-tactical aircraft of AF in attempt to reduce mid-air. ///USAF Info/

## GOODYEAR BUILDS ANTI-SKID SYSTEM FOR B-58

Automatic system prevents blowouts, other damage to tires caused by excessive braking, regardless of conditions, by controlling brake pressure. Sensory devices note wheel deceleration. ///Goodyear/



## RDNANCE

### FOUR MAJOR SUBCONTRACTORS FOR ARMY'S PERSHING

With Martin as prime, Army announced Bendix Eclipse-Pioneer, Bulova, Thiokol Chemical and Thompson Products as sub-contractors. Bendix will make inertial guidance, Bulova has fuzing and arming responsibility, propulsion falls to Thiokol and Thompson will build transport-erector-launcher. ///Army 0801/

### SPERRY GETS \$10 MILLION FOR TALOS DIRECTIONS

Award of \$10.3 million contract to Sperry Gyroscope was made by Navy's BuOrd for Weapon Direction equip for TALOS missile-armed ships. Surface-to-air TALOS now operational on USS GALVESTON, LITTLE ROCK and OKLAHOMA CITY. ///Navy BuOrd/

### CONTRACTS TOTALING \$5 MILLION FOR NAVY FIRE CONTROL

Arma gets \$1.6 million for gun and missile controls, Landsdowne Steel and Iron receives \$1.4 million for 3 inch 50 projectiles. Guided missile launcher components to be built by Thompson Products adds \$1.3 million to Thompson's till and Union Carbide receives \$1.25 million for reserve energizer parts of VT fuzes. ///Navy BuOrd/

### INFRARED USED FOR MISSILE RE-ENTRY DETECTION

said to be more valuable than radar. Aerojet-General pumping hard to do more in infrared missile detection, used their "red" equip to locate nose cone of JUPITER as it fell to earth in recent Canaveral tests. Look for more infrared detection contracts. ///Aerojet 0803/

### PERFORMANCE FIGURES ON BULL GOOSE

Weights two tons, 31 feet long, surface-to-surface, fiberglass body difficult to detect by radar, attains Mach 1.3. ///Mil Review/

### VICKERS DESIGNS ONE-MAN ANTI-TANK WEAPON

Small but complete guided weapon system can be carried, set up, fired by one man with minimum of tech know-how. Designated Vickers 891 infantry anti-tank weapon. No contract yet. ///Vickers 0725/

### MISSILE GROUND SUPPORT EQUIP NEEDS INCREASING

AF requirements for missile launch and support equip have shown tremendous increase in last four fisc years. In FY 1959, USAF will require \$943 for these items, five-fold increase over FY 1956. These requirements estimated to be about \$1 billion a year thru 1965.

///Aircraft Industries Assoc Rprt/

### \$29 MILLION NAVY MISSILE CONTRACT AWARDED BENDIX ON TALOS

One contract, \$21.5 million, for production of current TALOS. Second bid, \$7.5 million, is for advanced engineering. ///Bendix 0715/



# S SHIPS

## ATOMIC SUB RUN-DOWN

	<u>Name</u>	<u>Type</u>	<u>Disp.</u>	<u>Tons</u>	<u>In Serv</u>	<u>Builder</u>
	SSN 571 NAUTILUS	Attack	3200		9/30/54	General Dynamics
	SSN 575 SEA WOLF	Attack	3400		3/30/57	General Dynamics
	SSN 578 SKATE	Attack	2360		12/23/57	General Dynamics
	SSN 579 SWORDFISH	Attack	2360		1958	Portsmouth NavSY
	SSN 583 SARGO	Attack	2360		1958	Mare Island
	SSN 584 SEADRAGON	Attack	2360		1959	Portsmouth NavSY
	SSN 585 SKIPJACK	Attack	2830		1958	General Dynamics
	SSR(N)586 TRITON	Radar Picket	5650		1959	General Dynamics
	SSG(N)587 HALIBUT	Missile	3555		1959	Mare Island
	SSN 589 SCAMP	Attack	2830		1960	Mare Island
	SSN 589 SCORPION	Attack	2830		1960	General Dynamics
	SSN 590 SCULPIN	Attack	2830		1960	Ingalls Shipbuilding
	SSN 591 SHARK	Attack	2830		1960	Newport News
	SSN 592 SNOOK	Attack	2830		1960	Ingalls Shipbuilding
	SSN 593 THRESHER	Attack	3250		1960	Portsmouth NavSy
	SSG(N)594 PERMIT	Missile	4240		1960	Mare Island
	SSG(N)595 POLLACK	Missile	4240		1960	Portsmouth NavSY
	SSG(N)596 PLUNGER	Missile	4240		1960	not awarded yet
	SSK(N)597 TULLIBEE	Anti-Sub	2175		1960	General Dynamics
	SSN(FBM)598	Fleet Ballistic Missile	5400		1960	General Dynamics
	SSN(FBM)599	Fleet Ballistic Missile	5400		1960	General Dynamics
	SSN(FBM)600	Fleet Ballistic Missile	5400		1960	Mare Island

///General Dy 0801/

## NAUTILUS TRIP UNDER POLE SHOWS NAV SUPERIORITY

NAUTILUS recent North Pole cruise is most important from navigation standpoint. Highly classified new doppler techniques give U. S. edge in sub arsenal.

///Data/

## PLASTIC LIFEBOATS FOR COAST GUARD

expected to last as long as host ship. Plastic lifeboats offer big savings in maintenance and replacement costs since no painting or corrosion. Lane Lifeboat and Davit Corp. of Brooklyn will build.

///Coast Guard/

## AEROJET HAS STUDY CONTRACT FOR UNDERWATER CARGO VESSEL

capable of crossing oceans without regard to surface storms. Vessel has military concealment advantages as well. British firm, Mitchell Engineering, has already designed underwater atomic tanker, planned to cross Atlantic underwater at speed of 50 mph. and to be guided without a crew. Mitchell Engineering says their craft possible within five years. No details on Aerojet's study contract.

///Aerojet & Mitchell/

## DEADLINE DATA

### RUSSIAN SCIENTIFIC JOURNALS AVAILABLE IN ENGLISH

Natl. Science Foundation now making English translations of 53 Russian journals, 4 extensive series of translated Russian abstracts of scientific papers and 4 series of partial translations important Russian journals. Subscription prices for English versions set by NSF. Write National Science Foundation, Washington 25, D. C. for complete listing, subscription rates. ///NSF/

### FACT SHEET ON ARMY NIKE AVAILABLE

Gives background, deployment, organization of air defense units, general description, typical engagement, safety, land acquisition policies, training of personnel and future deployment. For copies write: Office of Public Information, Department of Defense, Washington 25, D. C. ///OPI DOD/

### NAVY AWARDS \$21 MILLION TO LOCKHEED FOR MORE P2V-7 A/C:

BuAer contract for \$21,363,992 goes to Lockheed for 26 P2V-7 NEPTUNE anti-sub a/c. This is 27th order for NEPTUNE since first model was built in 1944 and will extend production thru 1960.

///Navy Info 0804/

### WESTINGHOUSE GETS \$3 MILLION FROM NAVY FOR CARRIER LIFTS

World's most powerful elevators will be built by Westinghouse to carry Navy's heavy jet attack and fighter a/c to flight deck of first nuclear carrier, USS ENTERPRISE. Contract of \$3 million will pay for four (4) elevators, each capable of lifting a 45-ton aircraft from hanger deck to flight deck in 15 seconds. ///Navy Info 0807/

### NAVY SELECTS INTEK OIL TO OPERATE OFFSET DRILLING PROGRAM

Intek Oil Co. of Bakersfield selected from 31 bidders to operate offset drilling program on Naval Petroleum Reserve Number Three (Teapot Dome) in Wyoming. ///Navy Info 0805/

### UNIVERSAL MOULDED PRODUCTS BUILDS 40-FOOT PLASTIC BOATS

for Navy under \$345,345 contract for 13 boats. ///DOD press 0805/

### FAIRCHILD GETS PRODUCTION ORDER FOR AIR PARTICLE MONITORS

Navy places order with Fairchild Camera & Inst. for air monitors to safeguard health of atomic sub personnel with dual purpose of showing malfunctioning in reactor power plant system. ///Fairchild 0805/

### SBA DROPS INTEREST RATE FROM 6 TO 5-1/2 PERCENT

Other changes in Small Business Act include: SBA now permanent agency of Fed Government. Dollar limitations on biz loans to any one concern increased from \$250,000 to \$350,000. Larger loans can be made when banks participating. ///SBA/



# data R&D Searchlight

Here are some of our subscribers who can give you data on Research and Development Products and services which they can supply. Call them for data on products and services which they need.

## AIR ▲ SPACE

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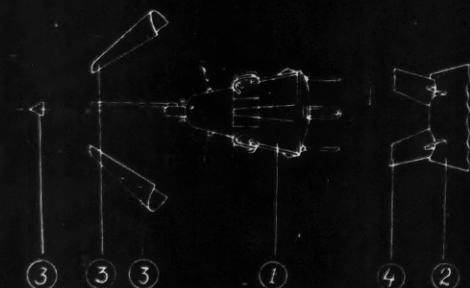
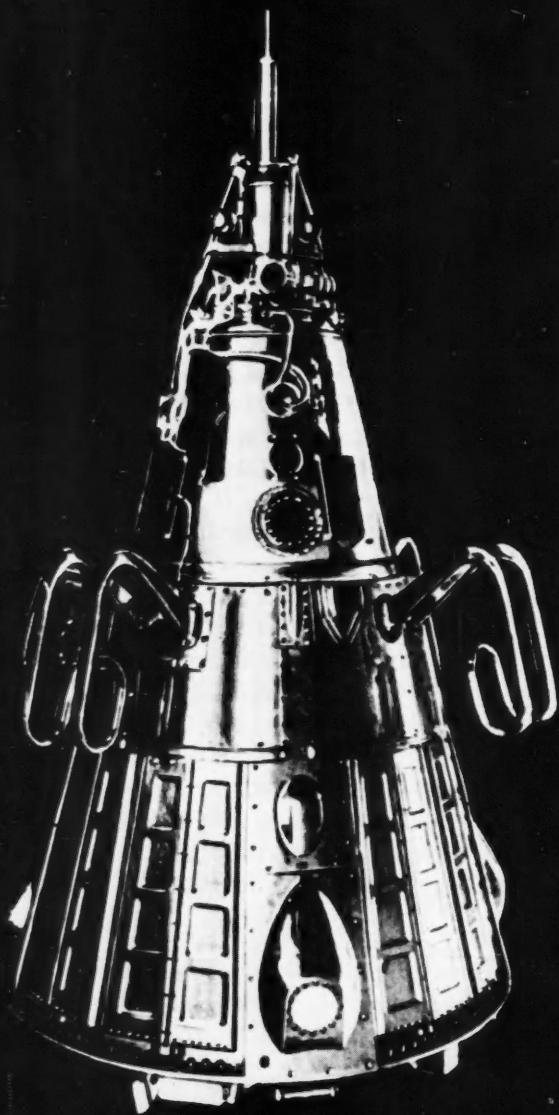
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SEPARATION OF SPUTNIK III FROM CARRIER ROCKET

1. Sputnik
2. Carrier rocket
3. Separable antenna arms
4. Separable shields

# SOVIET R&D

## SPUTNIK III FACT SHEET

### General Instrumentation

Instrumentation in Sputnik III falls into three main groups: the first to investigate cosmic phenomena, the second to study phenomena in the upper layers of the earth's atmosphere, and the third comprising the radios, telemetering equipment and power supplies.

Instruments designed to investigate properties of the atmosphere include devices for studying its composition and air pressure in upper layers. Among them are instruments for studying the earth's magnetic field which previous Sputniks did not have.

### Magnetic Field of Interest

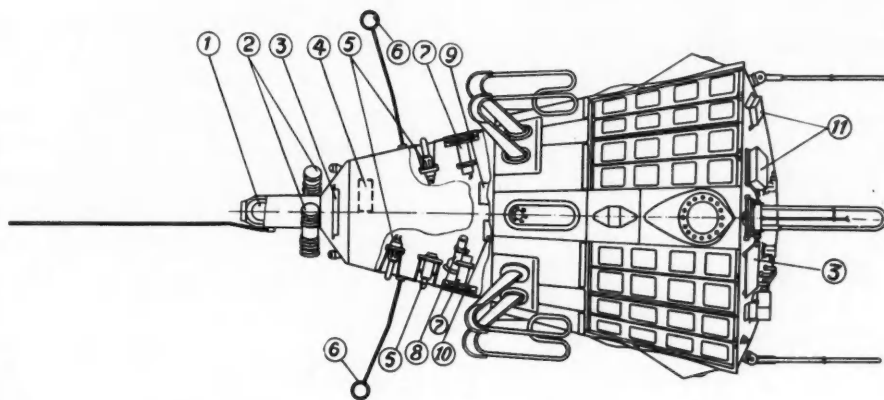
The earth's magnetic field is of intense interest to scientists in the USSR. Soviet scientists are interested in the possibilities of using electromagnetic fields in space as source of propulsive power, and before being able to harness space electromagnetic fields in space, earth's own magnetic field must first be more fully understood. G. I. Pokrovskiy, Soviet Space Flight Commission executive, writes in the current *Teckhnika Molodezhi* that with a weak power system which could flow around a space ship and change its magnetic field, much as ships are degaussed today to fool magnetic mines, the space ship would gravitate toward either the negative pole of the space magnetic field or the positive pole, depending upon the charge put on the ship . . . the positively charged space ship moving toward the negative magnetic pole and conversely.

### Micrometeor Measurement

Other instruments in the group concerned with cosmic phenomena are those for studying micrometeors, which rush in an incessant flow from outer space toward earth. Instruments aboard Sputnik III not only register every impact of a micrometeor, but also measure its strength.

#### SCIENTIFIC EQUIPMENT OF SPUTNIK III

- 1-Magnetometer
- 2-Photo-multipliers to register corpuscular radiation of the sun
- 3-Solar batteries
- 4-Instrument to register photons in cosmic rays
- 5-Magnetic and ionization manometers to measure pressure in the upper atmosphere
- 6-Ion traps
- 7-Electrostatic fluxmeters to measure electrical charge and tension of electrostatic field
- 8-Mass-spectrometric tube to register composition of ions at high altitudes
- 9-Instrument to register heavy nuclei in cosmic rays
- 10-Instrument to measure intensity of primary cosmic radiation
- 11-Devices to register micrometeoroids
- Electronic units of scientific equipment, radio measuring and radiotelemetering systems, time programming device, temperature regulating and measuring devices and electrochemical batteries are inside the body of the sputnik and are not seen in the diagram.



## SPUTNIK III

### Temperature Control

Because some of the instruments in Sputnik III operate most efficiently and accurately at particular temperature levels, temperatures inside are regulated automatically by circulating gaseous nitrogen and also by way of a device which changes the coefficient of the satellite's surface radiation and reflection.

### Programing and Telemetering

Sputnik III has a radiotechnical system to make precise measurements of its movement in orbit. One of the most complex is the multichanneled radiotelemetering system which continuously registers all of the measurements and data obtained by the instruments and "memorizes" them. When the Sputnik passes over the special reception stations on Soviet territory, the vast amount of "memorized" information is transmitted at very high speed.

Functions of all scientific and measuring equipment aboard the Sputnik are automatically controlled by the *time programing device*. This electronic brain turns all instruments on and off at scheduled periods and also operates the radio transmitters sending the data gathered to earth. The schedule is so devised to ensure the maximum economy in power consumption.

### Battery Power

Powering Sputnik III's instruments and radios are the electro-chemical batteries previously used in other satellites as well as solar batteries. Use of solar batteries makes it possible to considerably increase the period of active work of the Sputnik's instruments.

### Tracking

Sputnik III is being tracked by both radiotechnical and visual methods which are considerably improved compared with those used for earlier satellites. The Soviet Union has expanded its network of stations for re-

ceiving and analyzing information transmitted from the satellite. All this data is collected at a central station where it is collected with the aid of high-speed electronic computers.

### Corpuscular Measurement

Some of the other instruments sent with the satellite for the first time are designed to measure concentration of positive ions in the Sputnik's shell as a result of solar radiation and the intensity of the earth's electrostatic field.

Scientists believe, in this regard, that there are permanent electric currents in the ionosphere which are disrupted from time to time by showers of particles from the sun (corpuscular radiation) giving rise to both the aurora borealis and the magnetic storms that play such havoc with communications.

Sputnik III has instruments to measure the sun's corpuscular radiation and cosmic rays. They are of considerably more advanced design than those of Sputnik III. Apart from registering general intensity of cosmic radiation, these instruments record the composition of cosmic rays and several other properties.

### Orbit

Sputnik III, sent aloft in accordance with the program of the International Geophysical Year, has an apogee of 1167 miles from the earth. Plane of Sputnik III's orbit has an incline of 65 degrees to the plane of the equator. It requires a much higher initial thrust to launch a satellite into such a plane than would be needed for one set up at a lesser angle. But the 65-degree angle has the advantage of permitting wider study because the satellite passes over practically all populated areas of the globe, excluding only polar extremes.

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### FACT SHEET ON ARMY NIKE AVAILABLE

Gives background, deployment, organization of air defense units, general description, typical engagement, safety, land acquisition policies, training of personnel and future deployment. For copies write: Office of Public Information, Department of Defense, Washington 25, D. C. ///OPI DOD/

### NAVY AWARDS \$21 MILLION TO LOCKHEED FOR MORE P2V-7 A/C:

BuAer contract for \$21,363,992 goes to Lockheed for 26 P2V-7 NEPTUNE anti-sub a/c. This is 27th order for NEPTUNE since first model was built in 1944 and will extend production thru 1960. ///Navy Info 0804/

### WESTINGHOUSE GETS \$3 MILLION FROM NAVY FOR CARRIER LIFTS

World's most powerful elevators will be built by Westinghouse to carry Navy's heavy jet attack and fighter a/c to flight deck of first nuclear carrier, USS ENTERPRISE. Contract of \$3 million will pay for four (4) elevators, each capable of lifting a 45-ton aircraft from hanger deck to flight deck in 15 seconds. ///Navy Info 0807/

### NAVY SELECTS INTEX OIL TO OPERATE OFFSET DRILLING PROGRAM

Intex Oil Co. of Bakersfield selected from 31 bidders to operate offset drilling program on Naval Petroleum Reserve Number Three (Teapot Dome) in Wyoming. ///Navy Info 0805/

### UNIVERSAL MOULDED PRODUCTS BUILDS 40-FOOT PLASTIC BOATS

for Navy under \$345,345 contract for 13 boats.///DOD press 0805/

### FAIRCHILD GETS PRODUCTION ORDER FOR AIR PARTICLE MONITORS

Navy places order with Fairchild Camera & Inst. for air monitors to safeguard health of atomic sub personnel with dual purpose of showing malfunctioning in reactor power plant system. ///Fairchild 0805/

### SBA DROPS INTEREST RATE FROM 6 TO 5-1/2 PERCENT

Other changes in Small Business Act include: SBA now permanent agency of Fed Government. Dollar limitations on biz loans to any one concern increased from \$250,000 to \$350,000. Larger loans can be made when banks participating. ///SBA/



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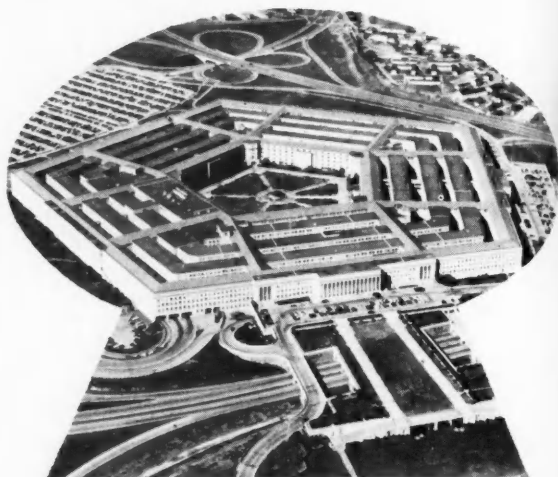
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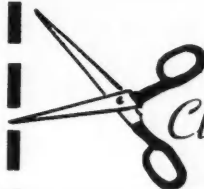
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